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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/423,911
Filing Date: February 28, 2000
Appellant(s): FINCK ET AL.

Alfred Froebrich
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 4, 2004 appealing from the Office action mailed June 18, 2003

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

5,362,340	Daly	11-1994
5,548,882	Windhaus	8-1996
JP 07-041896 A	Kamishiro	2-1995

"ASM Handbook: Desk Ed.", 2nd ed., 1998, p 62. (as evidence reference, see Response to Argument below).

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Interpretation

The phrase "as a final step for producing the aluminum strip for can making" has been interpreted by the examiner in light of the specification to be drawn to an intermediate strip gauge, as opposed to a final strip gauge. Nowhere in the specification does it teach that *final can stock sheet gauge* (see instant specification page 5 line 5 and page 6 lines 18-19) is reached solely by hot rolling, thereby eliminating cold rolling. Therefore the "final step" as mentioned above is held to be analogous to the intermediate gauge sheet taught by the prior art (see also discussion below).

The phrase "above the recrystallization temperature of the rolled strip within a range *including* 315°C to 320°C" (a range within a range) is interpreted by the examiner to mean above the recrystallization temperature and *optionally* between 315-320°C.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly et al. (US 5,362,340).

Daly et al teaches a process (see Table for comparison of prior art vs. instant process steps) for producing aluminum strip for can sheet having low earring (column 1 line 8) comprising the steps of: hot rolling an aluminum strip in a single stand reversible hot mill (column 3 lines 23-24) while minimizing recrystallization (column 3 lines 36-37; steps a, b, b1 in Table below), coiling (step c), and annealing in a furnace at 315-399°C (column 3 lines 35, 49-50; step d).

Concerning steps a) and b), Daly et al teaches multiple hot rolling passes in a single stand reversible hot rolling mill, to in order to convert an ingot to a hot rolled sheet (abstract, column 3 lines 22-28). The presently claimed "roughing step" (step a) is included in the step as taught by Daly et al of converting an ingot (with a typical thickness of 26.5-60.0 cm) to form a sheet. Daly

teaches further hot rolling reduction in said reversible mill to reach a final hot roll gauge of 0.13-0.38 cm (column 3 line 29), which meets step b.

process steps	instant invention	prior art of Daly
a	reversing roughing to form strip	hot rolling ingot in single stand reversible hot mill, to form sheet
b	finish hot rolling in reversing stand	further hot rolling reduction in said reversible hot mill
*b1	suppressing recryst.- last hot roll pass carried out w/out recryst., at 260-280C below recryst. temperature	hot roll exit 249-405C and final gauge 0.13-0.38cm, avoid recryst. at gauges below 1.90cm
c	coil	coil
d	recrystallize anneal, optionally between 315-320C	anneal 315-399C

Concerning step b(1), the hot roll exit temperature taught by Daly is 249-405°C, which entirely encompasses the presently claimed temperature of the last hot rolling pass range of 260-280°C. Furthermore, Daly teaches motivation to select a temperature range that would prevent recrystallization, such as the presently claimed narrow temperature range of 260-280°C. More particularly, Daly teaches "all hot line recrystallization at gauges below 1.90 cm (0.75 inch) or 1.27 cm (0.5 inch) is avoided. This favors cube texture development in the metal when the hot line exit material later recrystallizes, such as during batch anneal or continuous anneal" (column 3 lines 42-46). The examiner points out that the final hot rolling thickness ~0.2 cm (example) or 0.13-0.38 cm (column 6 line 2). Therefore, because Daly teaches recrystallization is avoided at gauges below 1.90 cm, and wherein the final thickness is 0.13-0.38 cm, Daly clearly teaches avoiding recrystallization in at least the last hot rolling pass.

With respect to the overlap in temperature ranges, overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility. The examiner submits that changes in concentration

or temperature will generally not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical, i.e. they produce a new and unexpected result (however, in the instant case, the result of avoiding recrystallization is expected and preferred by the prior art, see discussion above). "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages"). A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Because Daly recognizes that said last hot rolling pass temperature is a result effective variable, wherein the expected (and preferred) result is absence of recrystallization, the determination of the optimum or workable ranges of the temperature of said last hot rolling pass is considered routine experimentation.

Concerning step c), Daly teaches a step of coiling (column 4 line 25), prior to annealing.

Concerning step d), the temperature for annealing taught by Daly completely overlaps the presently claimed (optional) annealing temperature range. Daly teaches the batch or continuous anneal produces recrystallization (column 3 lines 44-46), thereby producing favorable cube texture and a low earring sheet (column 3 line 44, column 2 line 9). The presently claimed

method of using a continuous pusher type furnace falls within the scope of the method of heat treating using a continuous furnace as taught by Daly.

In conclusion, because Daly teaches a process of: (a, b) hot rolling aluminum into a strip by a reversible hot mill, wherein (b1) the hot rolling has a finishing temperature that overlaps the presently claimed range and is preferably performed without recrystallization (column 3 lines 42-46), followed by (c) coiling said strip, and (d) annealing at temperatures that overlap the presently claimed range and provide recrystallization, Daly et al is held to create a prima facie case of obviousness of the presently claimed invention.

Concerning instant claim 6, Daly et al does not specify that the last three hot rolling passes are carried out without recrystallization. However, because Daly et al teaches against recrystallization at gauges below 1.9 cm or 1.27 cm (column 3 lines 42-46), it would have been within the level of one of ordinary skill in the art to carry out three hot rolling passes to a final gauge of 0.13-0.38 cm (column 6 line 2), without recrystallization.

3. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly et al. (US 5,362,340) in view of JP 07-041896A (JP'896).

Daly is discussed in paragraphs above.

Daly teaches a process of: (a, b) hot rolling aluminum into a strip by a reversible hot mill, wherein (b1) the hot rolling has a finishing temperature that overlaps the presently claimed range and is performed without recrystallization (column 3 lines 42-46), followed by (c) coiling said strip, and (d) annealing at temperatures that overlap the presently claimed range and provide recrystallization. Concerning step b1, Daly et al specifies that "the hot mill schedule is such that recrystallization in the hot mill is minimized or reduced" (Daly column 3 lines 36-37). Daly

teaches the hot roll exit temperature is 249-405°C, which overlaps the presently claimed hot roll exit temperature range (260-280°C).

Concerning motivation to hot roll in the last pass at low temperatures of between 260-280°C (step b1), JP'896 (who is also drawn to forming and heat treating Al-Mg alloy sheets) teaches that it is important to "warm" roll ≥ 30% in a low temperature range of 100-350°C after hot rolling, because an Al-Mg type alloy sheet excellent in deep drawability can be produced (wherein said working performed on a Al-Mg alloy creates a particular crystallographic texture that is excellent in formability, see abstract). It would have been obvious to one of ordinary skill in the art to perform rolling at temperatures in the low range of 100-350°C, for the process of producing an aluminum sheet from ingot in a reversible mill taught by Daly, because JP'896 teaches said low temperature finish rolling improves deep drawability and formability (abstract). Though rolling at low temperatures is termed by JP'896 as "warm" rolling rather than "hot" rolling, because the temperature range taught by JP'896 overlaps (and wherein the definition of warm rolling is rolling below the recrystallization temperature, which the instant invention, Daly, and JP'896 all teach, see further discussion of said term in "Response to Arguments" below), said rolling step is held to meet the instant limitation.

Concerning instant claim 6, Daly et al does not specify that the last three hot rolling passes are carried out without recrystallization. However, because Daly et al teaches against recrystallization at gauges below 1.9 cm or 1.27 cm (column 3 lines 42-46), it would have been within the level of one of ordinary skill in the art to carry out three hot rolling passes to a final gauge of 0.13-0.38 cm (column 6 line 2), without recrystallization.

4. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly et al in view of Windhaus et al (US 5,548,882 A).

Daly et al teaches an apparatus for hot rolling aluminum comprising: a means for reversing rough rolling (Fig. 1B), a means for finish rolling, said means including a four high reversing roll stand with winding devices on each side (Fig. 1D), and a heat treating means (Fig. 1C).

Daly et al does not teach said heat treating means: is a) a pusher type furnace with a pallet transport system or b) a means for transferring said coil to a furnace.

Concerning item a), Windhaus teaches a means for transferring the coiled strip to the heat treating means, including a pusher-type pallet system (column 1 lines 48-51) which transports the coils through the furnace.

Concerning item b), Windhaus teaches means for transferring the coiled slab bundles to the pallet car (column 2 lines 20-23).

It would have been obvious to use the pusher type pallet system and means for transferring the coiled slab to the pallet bar as taught by Windhaus, in the strip making plant taught by Daly, because Windhaus teaches that said transporting pallet system reduces the risk of deformation of the bundles by the transporting means (column 1 lines 58-60).

(10) Response to Argument

Appellant's argument that the present invention is allowable over the prior art of record because the exit temperature taught by Daly "*may* be higher than 332°C" (arguments p 4-5) has not been found persuasive. See discussion concerning step b1) above. Because Daly teaches

recrystallization is preferably avoided at gauges below 1.90 cm, and wherein the final thickness is 0.13-0.38 cm, Daly clearly teaches avoiding recrystallization in at least the last hot rolling pass is preferable. With respect to the overlapping temperature range, because Daly recognizes that said last hot rolling pass temperature is a result effective variable, wherein the expected result is absence of recrystallization (which is preferred by Daly, see column 3 lines 41-43), the determination of the optimum or workable ranges of said last hot rolling pass temperature is considered routine experimentation.

Appellant's argument that the present invention is allowable over the prior art of record because the exit temperature taught by JP'896 *may* be above the recrystallization temperature (arguments p 5-6) has not been found persuasive. JP'896 teaches motivation to roll at low temperatures for a finish rolling step, in that said step improves deep drawability and formability (JP'896 at abstract), wherein warm rolling by definition is below the recrystallization temperature. In the "Response to Arguments/Amendment" section of the office action mailed 5/03/02, the definition of "warm" working was submitted by the examiner- "Warm working is defined as working done at elevated temperatures below the recrystallization temperature", as set forth in "ASM Handbook: Desk Ed.", 2nd ed., p 62".

Appellant's argument (p 6-7) that the present invention is allowable over the prior art of record because Daly does not teach "means for finish rolling...so that the last hot rolling passes occur without recrystallization" has not been found persuasive. As stated above, Daly et al teaches an apparatus for hot rolling aluminum comprising: a means for finish rolling, said means including a four high reversing roll stand with winding devices on each side (Fig. 1D), which meets said limitation. A claim containing a "recitation with respect to the manner in which a

claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Because the prior art teaches an apparatus with identical structure and the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus, the rejection is proper. Even so, as stated above, Daly clearly teaches avoiding recrystallization at a temperature that overlaps the instant range for at least the last hot rolling pass is preferable (see above discussion). Therefore, the prior art also teaches substantially identical manner in which the apparatus is employed.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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May 16, 2005

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